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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/607,005	06/27/2003	Koji Masuda	239545US2	4936

22850 7590 07/08/2004

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EXAMINER	
PHAM, HAI CHI	

ART UNIT	PAPER NUMBER
2861	

DATE MAILED: 07/08/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/607,005	MASUDA, KOJI	
	Examiner	Art Unit	
	Hai C Pham	2861	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-13,16-19,21 and 22* is/are rejected.

7)☒ Claim(s) *14,15 and 20* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *09/26/03*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Claim Objections

2. Claims 1 and 11 are objected to because of the following informalities:

Claim 1:

- The following limitation "an image forming device array that *further* comprises image forming devices" at line 7 does not further limit or define itself since a device array would include *by definition* a plurality of devices.

Claim 11:

- Similarly, the following limitation "an image forming device array that *further* comprises image forming devices" at line 7 does not further limit or define itself since a device array would include *by definition* a plurality of devices.

Appropriate correction is required.

3. Claim 6 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim, or amend the claim to place the claim in proper dependent

form, or rewrite the claim in independent form. Claim 6 presents a limitation, which is an exact repetition of the last limitation recited in the base claim 1.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

5. The following claims are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 4:

- Claim 4 recites the following limitation "acquiring the range of the property value that the light emitting device should take, based on the property values of the light volumes of a plurality of the preceding light emitting devices" (emphasis added) appears to be ambiguous in that, in one instance, the property value and the light volume are treated as two distinct entities, namely in claim 3 where the property value of each of the light emitting device is derived based the light volume of each of the light emitting devices set up by the operating means. To expedite the examination of claim 4, it will be assumed that the operating processing means acquires the range of the light intensity distribution based on the light intensity distribution of a plurality of the preceding light emitting devices.

Claim 7:

- The following limitation "in the case that an interval Pa between one of the light emitting devices on the edge of one of the light emitting device array chips and another one of the light emitting devices on the edge of an adjacent one of the light emitting device array chips is different from the predetermined interval p by more than 10%, namely, in the cases of Pa > 1.1P and Pa < 0.9P" appears to be conflicting in that Pa < 0.9P is less than 10% as required.

Claim 10:

- The method claim 10 fails to provide the necessary steps based on which one can perform the assemblage of the optical write head as the method claim is intended to achieve.

Claim 22:

- The method claim 22 fails to provide the necessary steps based on which one can perform the assemblage of the optical write head as the method claim is intended to achieve.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 1-6, 8-13, 21-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Obata (U.S. 6,172,700) in view of Kamimura (U.S. 6,266,077).

Obata discloses a writing device for an image forming apparatus a light emitting device array (LED array 1) that further comprises a plurality of light emitting device array chips (LED chips 3), each of which comprises a plurality of light emitting devices (LEDs 2) that are arranged at a predetermined interval P (distance a between nearby LEDs), and an image forming device array that further comprises image forming devices (although not shown, the imaging lenses such as the rod lens array are inherently included in the electrostatic printing device using a light emitting device array for forming an electrostatic latent image on a photosensitive drum), wherein the light volume of the light emitting devices that are located on and near an edge of the light emitting device array chip can be set differently from other light emitting devices (due to gap between nearby LED chips 3, which is different from the distance a between nearby LEDs within each LED chip, the quantity of light emitted by the LEDs located at the ends of each of the LED chips). With regard to claims 11 and 21, Obata further teaches the light volume of the light emitting devices being set up based on the gradient of an approximated regression line for exposure areas corresponding to a plurality of the light emitting devices (the corrected image data corresponding to the interval between nearby LED chips being of halftone).

However, Obata fails to explicitly teach the light volume of the light emitting devices being set up such that a predefined property value concerning an exposure intensity distribution of each of the light emitting devices falls within a predetermined

range, the predetermined range being defined for an effective image area in its entirety, the determination of the correlation between the light volume and the property value of the light emitting device, and the compensation value being a driving current, more than half elements being located at ends of the LED chip, and the predetermined cycle.

Kamimura discloses a method of compensating for output variations in a printing head, which comprises an LED array (15), wherein the LED driver (14) is configured to vary the amount of driving current supplied to each LED in accordance with the compensation data such that the optical energy output of the LED array becomes uniform as a whole within a predetermined range extending above and below the mean LED output energy value. Kamimura further teaches the property value of light intensity of each of the LED elements in the LED array being measured, and by this more than half of the entire number is of the light emitting elements located on or near the edge of the LED array. Kamimura further teaches the calculated target values being the mean value of the measured optical energy output values of a certain number of LEDs.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to set the compensation of the light intensity distribution of the outer end LED units of Obata by correcting the corresponding driving currents such that the light intensity distribution is uniform as taught by Kim. The motivation for doing so would have been to

The method claims 10 and 22 are deemed to be clearly anticipated by the functions of the above structures.

8. Claims 7 and 16-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Obata in view of Kamimura, as applied to claim 11 above, and further in view of Sawada (JP 8-118722).

Obata, as modified by Kamimura, discloses all the basic limitations of the claimed invention except for the light volume of each of the light emitting devices is set up based on the magnitude of the interval of the light emitting device located at the ends of the LED chips as compared to the interval between nearby LEDs.

Sawada, an acknowledged prior art, discloses a driving circuit for an LED print head, which comprises a plurality of LED array chips having a gap G between adjacent LED array chips being different from the interval P of the light emitting elements, wherein the driving current flowing though the light emitting elements located at the ends of each LED array chip varies dependent on the difference between the intervals G and P, namely the driving current is increased when G is larger than P and is decreased when G is smaller than P (see English Translation, paragraphs [0033] and [0034]).

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to adjust the driving current supplied to the light emitting elements disposed at the end of the LED array chip in accordance to the relationship between the intervals G and P as taught by Sawada in the modified device of Obata. The motivation for doing so would have been doing to be able to effectively cancel the density difference occurred at the gap between two adjoining LED array chips, which is

dependent on the discrepancy between the above gap and the pitch of the light emitting elements as explained by Sawada.

Allowable Subject Matter

9. Claims 14-15 and 20 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

10. The following is a statement of reasons for the indication of allowable subject matter: the primary reason for the indication of the allowability of claims 14-15, 20 is the inclusion therein, in combination as currently claimed, of the limitation regarding the relationship between the interval of the light emitting devices located near the edge of the light emitting device array chip and the interval of the image forming devices, which is not found taught the prior art of record considered alone or in combination.

Pertinent prior Art

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Kim (U.S. 5,767,979) recognizes that the light emitting device array including a plurality of LEDs arranged at regular intervals has an uneven light intensity distribution across the array and experiences losses of illuminance at the outer ends of each array. To compensate for the unevenness of illuminance, the light emitting diodes disposed at

an outer side are provided with a higher voltage or higher driving current such that the light intensity distribution is within a predetermined range or uniform as a whole.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hai C Pham whose telephone number is (571) 272-2260. The examiner can normally be reached on M-F 8:30AM - 5:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen D Meier can be reached on (571) 272-2149. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Hai C Pham

HAI PHAM
PRIMARY EXAMINER

July 6, 2004